

APPLICATION OF LIME.

As we hope our agricultural friends who have lime stone convenient and wood in abundance, will make use of lime in preparing land for wheat, we copy an article from a late number of *The Mark Lane Express*, on the best mode of applying lime, and we perfectly concur with the writer. The article referred to recommends 160 bushels to the acre, or a bushel to the square perch.—This quantity may be reduced at the option of the farmer. By putting only half a bushel in each heap, it will make the quantity 80 bushels per acre, and at three quarters of a bushel for each heap, it will make 120 bushels per acre. The following is the article:—

"There seems to be a growing difference of opinion as to the state in which lime should be applied to the soil. We have always been of opinion that lime, generally speaking, operates upon the soil in two ways, namely, chemically, and mechanically when it is merely to operate mechanically, as to lighten heavy soils, it is of no moment whether it be applied in a caustic state or not; but when intended to act chemically, we hold that it must be applied in a caustic state. We can speak of our own personal experience as to the practice over a very large district many thousand acres of reclaimed land in the West of England, where lime was the article generally used in the first instance to stimulate the land to fertility. The lime is deposited on the land in heaps a perch a part each way, the heaps of course varying in size according to the quantity per acre required to be applied, but ordinarily one bushel in each heap. It is then covered with a portion of the soil, and suffered to remain until it begins to slack into powder, and which of course varies in point of time according to the dryness or moisture, of the weather: the heaps are then turned and suffered again to stand until the small lumps remaining are slacked, when it is spread upon the soil whilst yet in a caustic state; and immediately well harrowed into the soil. That it is more effective in a caustic than an effete state, has been frequently proved in cases where, from some cause, two or three rows in a field have been suffered to remain uncovered, and by being exposed to heavy rain, was run to mortar before spreading; in such cases, the difference has been manifest in the crop. We know it to be the practice in some districts to mix the lime with head lands, ditch scrapings, and any other mould that can be collected, in large heaps turning it over, and in due time carting it on the land. The operation of the lime, however, in this mode, is precisely the same as in the mode first described, with the difference, that in the former, method its immediate effect is on the soil of the field, in the latter on the soil collected in the heaps with which it is mixed. It has been said that, in as much as lime in a caustic state has been found not to be injurious to animal life; it therefore would produce no effect upon the soil; abstractedly this may be true; but it is the application of moisture which causes it to operate upon the soil, and were water applied in proper quantity, it would immediately become destructive to animal life. This subject is of great importance to the farmer."

In a communication addressed to the Royal English Agricultural Society upon the same subject by a Mr. W. H. Fisher of

Conduct Street, London, are the following observations:—

"The lime will be found, if properly burned, on a second ploughing to be crumbled into pieces or powder, and on harrowing will be ultimately mixed with the soil. From the heat evolved during the slacking of the lime under ground, and its causticity, which diffuses itself by the agency of the moisture it meets with through the soil, it will be found to destroy, or at any rate to be extremely obnoxious to wireworms, slugs, grubs, and other enemies which the farmer has to contend with, and which are frequently the cause of failure in his crops, as well as in rendering most vegetable matter in the soil soluble, and food for future crops. In conclusion, the good effects of applying lime in the manner recommended, that is, in the unslacked state, I have myself experienced, and have received ample testimony to the like purport from extensive agriculturists, who at my suggestion have adopted the plan."

From these observations of experienced agriculturists, the Canadian farmer cannot be at a loss as to the best mode of applying lime. The first mode recommended we conceive to be the best.

SOILS.

Surface soil of a fine-grained loam, from the vicinity of Brunswick, being analyzed. 100 parts of the soil contained:—

Silica and fine siliceous sand.....	87,859
Alumina.....	2,652
Peroxide of iron with a large portion of protoxide.....	5,132
Protoxide and peroxide of manganese.....	0,840
Lime principally combined with silica.....	1,459
Magnesia <i>idem</i>	0,280
Potash and soda <i>idem</i>	0,090
Phosphoric acid in combination with iron.....	0,505
Sulphuric acid in combination with lime.....	0,063
Chlorine in common salt.....	0,006
Humus.....	1,109

100,000

This soil is remarkable from the circumstance, that not a single year passes in which corn plants are cultivated upon it without the stem of the plants being attacked by rust. Even the grain is covered with a yellow rust, and is much shrunk. It does not suffer from want of drainage; it is well exposed to the sun, is in an elevated situation, and in a good state of cultivation. In order to ascertain whether the rust was due to the constituents of the soil, (phosphate of iron?) or to certain fortuitous circumstances unconnected with their operation, a portion of the land was removed to another locality, and made into an artificial soil of fifteen inches in depth. Upon this barley and wheat was sown; but it was found, as in the former case, that the plants were attacked by rust, whilst barley growing upon the land surrounding this soil was not at all affected by the disease. From this experiment it follows, that certain constituents in the soil favour the development of rust.—Lime in sufficient quantity, is considered to be the most effectual remedy, applied to soils that produce the disease of rust in corn crops. Soils sometimes contain a small portion of sulphate of the protoxide of iron, (*green vitriol of commerce*), and this salt exerts a poisonous action upon plants; until its action is checked by the application of lime to the soil.

Analysis of a very fertile alluvial soil from Honigpolder; no manure had ever been applied to it. 100 parts contain:—

Siliceous sand separated by the sieve.....	14.5
Earthy portion of the soil.....	85.5
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100 parts of the latter consisted of:	
Silica and fine siliceous sand.....	64,800
Alumina.....	5,700
Peroxide of iron.....	6,100
Peroxide of manganese.....	0,090
Lime.....	5,800
Magnesia.....	0,840
Potash, principally in combination with silica.....	0,210
Soda, <i>idem</i>	0,393
Phosphoric acid combined with lime.....	0,490
Sulphuric acid, <i>idem</i>	0,210
Chlorine (in common salt).....	0,201
Carbonic acid, combined with lime.....	3,920
Humus soluble in alkalies.....	2,540
Humus.....	5,600
Nitrogenous matter.....	1,582
Water.....	1,544

100,000

Corn has been cultivated for seventy years upon this soil, which never has received dung or any other kind of manure; it is, however, occasionally fallowed. The subsoil retains the same composition as the surface soil for a depth of six to twelve feet, so that it may be considered inexhaustible. When one portion of the soil is rendered unfitted for use, the inferior layers are brought up to the surface.

Surface soil of a field, in Germany, very remarkable for its fertility. It has never been manured or allowed to lie fallow, and yet has produced for the last 160 years the most beautiful crops; thus furnishing a remarkable example of unimpaired fertility. 100 parts of the soil consisted of:

Coarse and fine siliceous sand with a little magnetic iron sand.....	35.0
Barthy matter.....	65.0

100.0

100 parts of the same soil contained:

Silica.....	77,900
Alumina.....	8,514
Peroxide of iron.....	6,592
Peroxide of manganese.....	1,520
Lime.....	0,927
Magnesia.....	1,160
Potash, principally in combination with silica.....	0,240
Soda, <i>idem</i>	0,640
Phosphoric acid, combined with lime and iron.....	0,651
Sulphuric acid, combined with lime.....	0,011
Chlorine (in common salt).....	0,010
Humus soluble in alkalies.....	0,540
Nitrogenous matter.....	1,108

100,000

It is apparent from the above analysis that, notwithstanding the long period which this land has been cultivated without manure, it still remains very rich in matters adapted to the nutrition of plants.

Liebig gives many more analyses of soils, made in different parts of the globe, to show the ingredients of which they consist, and their different degrees of fertility; but we think it unnecessary to copy them all. He concludes the chapter on the "Chemical